

SECTION 15000
MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The General Conditions, Supplementary General Conditions, and Special Conditions of this Contract form a part of this Division of Specification.
- B. This section forms a part of all sections under Division 15 Mechanical.
- C. Requirements herein augment or clarify articles specified under aforementioned General and Special Conditions.

1.2 SITE EXAMINATION

- A. Before submitting bid, Contractor shall examine the premises and satisfy himself as to the existing conditions under which he will be obliged to operate or what will affect the work under this Contract. Contractor shall report to the Architect any condition which might prevent installation of equipment or systems in the manner intended. No allowance will be made subsequently in this connection in behalf of this Contractor for error or negligence on his part.

1.3 CODES AND STANDARDS

- A. Latest effective publications of applicable codes and ordinances of local governing agencies and of the following standards, codes, etc., as they apply, form part of these specifications as if were written fully herein. The publication date is the publication in effect as of the bid date, except when a specific publication date is listed. These will be referred to throughout in abbreviated form.

- 1. Virginia Uniform Statewide Building Code (VUSBC)
- 2. National Fire Protection Association (NFPA)
- 3. Factory Mutual Engineering Association (FM)
- 4. Underwriters' Laboratories, Inc. (UL)
- 5. Occupational Safety and Health Administration (OSHA)
- 6. American Society of Mechanical Engineers (ASME)
- 7. American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (ASHRAE)
- 8. Air Conditioning and Refrigeration Institute (ARI)
- 9. American National Standards Institute (ANSI)
- 10. American Society for Testing and Materials (ASTM)

11. Health Care Facilities Handbook
12. American Welding Society (AWS)
13. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS)
14. Air Movement and Control Association, Inc. (AMCA)
15. Sheet Metal and Air Conditioning Contractors' National Association, Inc. (SMACNA)
16. American Gas Association (AGA)
17. Electrical Testing Laboratories (ETL)
18. Americans with Disabilities Act (ADA)
19. International Mechanical Code
20. International Plumbing Code

1.4 PERMITS, INSPECTIONS, FEES AND NOTICES

- A. Unless modified by the General Conditions and Supplementary Conditions, work is to be executed and inspected in accordance with governing codes, laws, ordinances, rules, and regulations applicable to particular class of work, and fees in connection therewith are to be paid by this Contractor.
- B. This Contractor is to arrange for project inspection, paying charges pertaining hereto. He shall give the proper authority requisite notice relating to work under his charge, shall afford Architect and authorized inspectors every facility for inspection and shall be responsible for violations of law. Upon completion of work, he shall have work inspected, if required, obtaining certificate of inspection and approval from inspecting agency, and shall deliver such certificate to Architect.

1.5 SCOPE OF WORK

- A. Work required for Division 15 Mechanical shall include labor, materials, equipment, appurtenances, and services to provide first class working systems, tested and ready for operation. Installation shall conform to the drawings and specifications, incorporating the best standards of workmanship. Materials shall be new and of good quality, and labor shall be performed by skilled mechanics under the direction of a competent superintendent.

1.6 DRAWINGS AND SPECIFICATIONS

- A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable quality standards for materials, equipment and workmanship, and to provide operable mechanical systems complete in every respect.
- B. Apparatus, appliance, material or work not shown on drawings but mentioned in the specifications, or vice versa, or incidental accessories necessary to make the work

complete and ready for operation, even if not particularly specified, shall be provided by the Contractor without additional expense to the Owner.

- C. Contractor shall examine and consult drawings and specifications of other trades to better familiarize himself with the character of construction and include in his bid work of his trade shown or reasonably inferred. He shall consult the drawings and specifications of other trades in installing his work.
- D. This Contractor shall be thoroughly familiar with specified products relating to his work and shall submit written objections prior to bid if he objects to the proposed use of any product.
- E. Should structural difficulties prevent the installation of piping, ductwork, fixtures, or equipment at the points shown on the drawings, necessary deviations therefrom, as determined by the Architect, will be permitted and shall be made without additional cost. This Contractor shall work with other Contractors and arrange his work so as not to interfere with the work of other Contractors.
- F. Drawings are diagrammatic, intending to show general arrangement and location of system components, with no attempt made to show every ell, tee, fitting, etc. Due to the small scale of the drawings, and to unforeseen job conditions, required offsets and fittings may not be shown but shall be provided at no change in Contract price. Ducts and pipes shall be run in spaces indicated as job conditions warrant, arranged for most convenient access for servicing, with due consideration given to swing joints and to other Contractor's work. If departures from the contract drawings are deemed necessary, Contractor shall submit details of such departures and the reasons therefor as soon as practicable after award of contract to the Architect for approval. Make no such departures without prior written approval of the Architect.
- G. Contractor shall maintain on site a current set of drawings and specifications.
- H. In case of conflicting information on the drawings and/or in the specifications, the proper interpretation shall be made by the Architect.
- I. Disagreements occurring between trades covering various phases of the work shall be referred to General Contractor for decision.
- J. Changes and additions to scope of the work under this contract shall be submitted to the Architect and his written approval obtained before proceeding with the changed work.

1.7 WORDING

- A. Specifications are of simplified form and include incomplete sentences. Omission of words or phrases such as "the Contractor shall", "shall be", "provide", "furnish", "a", "an", "the" is intentional. Omitted words or phrases shall be supplied by inference.

1.8 DEFINITIONS

- A. "Provide": To furnish, erect, install, and connect up complete and ready for regular operation, particular work referred to, unless specifically indicated or specified otherwise.
- B. "Work": Labor and materials, or both, including apparatus, controls, accessories, and other items necessary or required to provide a complete installation.

- C. "Piping": Pipe and fittings, flanges, valves, controls, hangers, traps, drains, insulation, and items necessary or required in connection with or relating to such piping to provide a complete installation.
- D. "Concealed": Embedded in masonry or other construction, installed behind wall furring, within double partitions or above hung ceilings, in trenches, tunnels, or crawl spaces.
- E. "Exposed": Not installed underground or "concealed" as defined above.
- F. "Indicated" or "Shown": As indicated or shown on drawings.
- G. "Noted": As indicated on drawings and/or specified.
- H. "Contract" or "this Contract" shall consist of documents listed in the Contractor Agreement and Supplemental Agreements, data or drawings which could reasonably be required to complete the work. This shall be considered as one instrument and referred to collectively as the "Contract Documents".
- I. Whenever the words "as shown" or "indicated" are used in the description of any part of the work, it shall be understood to mean as shown on the contract drawings, unless another meaning is plainly indicated or noted.

1.9 SUBMITTALS

- A. Products List:
 - 1. Within 15 days after Contract Award Date, submit to Architect a complete list of major products proposed to be used, with the name, address, and phone number of the manufacturer, manufacturer's representative, and the installing subcontractor. List shall include the following:
 - a. Rooftop Unit
- B. Submit Shop Drawings, Product Data and Samples within thirty (30) days of award of contract and in accordance with the General Conditions and Supplementary Conditions. All interdependent equipment, i.e., chillers, boilers, pumps and associated hydronic equipment, shall be submitted simultaneously. Submittals are required for items provided under this specification. Review of submittals by the Architect and associated action taken by the Architect does not relieve the contractor of requirements set forth by the contract documents.
- C. Submittals shall clearly indicate all features, options, capacities, etc. to show compliance with the drawings and specifications.
- D. The Contractor Shall:
 - 1. Coordinate submittal with requirements of the work and of the Contract Documents.
 - 2. Notify the Architect in writing, at time of submission, of deviations in the submittals from requirements of the Contract Documents.
 - 3. Begin no fabrication or work which requires submittals until return of submittals with Architect approval.

4. Make submittals promptly and in such sequence as to cause no delay in the work or in the work of other contractors.
- E. Drawings prepared by the Contractor, for the Contractor's use, shall be submitted for review. Such drawings include, but are not limited to: duct fabrication and layout drawings, fire protection piping and layout drawings, equipment layout drawings, coordination drawings, and drawings of miscellaneous details.
- F. Prepare Product Data as Follows:
 1. Clearly mark each copy to identify pertinent products or models.
 2. Show performance characteristics and capacities.
 3. Show dimensions and clearances required.
 4. Show wiring diagrams, piping diagrams and controls.
- G. Prepare manufacturer's standard schematic drawings and diagrams as follows:
 1. Modify drawings and diagrams to delete information which is not applicable to the work.
 2. Supplement standard information to provide information specifically applicable to the work.
- H. Prepare office samples of sufficient size and quantity to clearly illustrate:
 1. Functional characteristics of the product, with integrally related parts and attachment devices.
 2. Full range of color, texture and pattern.
- I. Submittals shall contain:
 1. The date of submission and of any previous submissions.
 2. The project title and number.
 3. Contract or project identification.
 4. The names of:
 - a. Contractor.
 - b. Supplier.
 - c. Manufacturer.
 5. Identification of the product, and specification section.
 6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features or materials.
 8. Applicable standards.
 9. Identification of deviations from Contract Documents.
 10. Identification of non-complying features and reason for the non-compliance. The reason shall be specific in nature.
 11. Identification of revisions on resubmittals.
 12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.
- J. Submittals of Mechanical and Plumbing Equipment requiring maintenance shall be accompanied by three (3) sets of the manufacturers' standard Operating and Maintenance Instructions and Parts Lists. A bound manual with an index and identification tabs shall be prepared for each set. These are to be retained by Contractor, until completion of job, at which time they will be assembled and turned over to the Architect.

1.10 MANUFACTURER'S INSTRUCTIONS

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to Architect.
1. Maintain one set of complete instructions at the job site during installation and until completion.
- B. Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.
1. Perform work in accordance with manufacturer's instructions. Do not omit any preparatory steps or installation procedure unless specifically modified or exempted by Contract Documents.
 2. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions.
 3. Do not proceed with work without clear instructions.

1.11 ADDITIONAL REQUIREMENTS

- A. All equipment and appliances that comprise part of the building mechanical systems regulated by the International Mechanical Code shall be listed and labeled in accordance with the International Mechanical Code.
- B. All listed and labeled equipment shall be installed in accordance with its listing label, manufacturer's installation instructions, and the International Mechanical Code.

- C. Manufacturer's installation instructions shall be available at the job site for use and inspection.

PART 2 - PRODUCTS

2.1 MANUFACTURING STANDARDS

- A. Materials shall be new and designed and/or constructed for their intended use and application. Defective equipment or equipment damaged in the course of installation or test shall be replaced or repaired in a manner meeting the approval of the Architect. Materials to be furnished under this specification shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design. All items of the same type and rating shall be identical.

2.2 ELECTRICAL REQUIREMENTS

- A. Except as otherwise detailed or specified, all interconnecting power wiring required to operate electrical devices and equipment furnished in this Division will be provided under Division 16 Electrical.
- B. All controllers, motors, starters, and individual component fusible protection for all accessory equipment in accordance with NEC, etc. shall be as specified under Division 16 Electrical of the specifications and furnished with equipment under this division. Starters and controllers that are not mounted on the equipment shall be turned over to the Electrical Contractor for installation.
- C. Disconnect switches shall be provided under Division 16 Electrical unless specified in Division 15 Mechanical as integral with equipment.
- D. Requirements for electrical apparatus, devices, controls, etc. furnished in this Division shall conform to Division 16 Electrical.
- E. Control and interlock, wiring and conduit required for electrical devices and equipment furnished in this Division will be provided under this division.

2.3 MOTORS AND MOTOR CONTROLS

- A. All motors furnished as a part of the work of this Division, unless otherwise specified, shall be furnished by the manufacturer of the equipment served and shall be mounted and aligned so as to run free and true.
- B. All motors shall be provided with a terminal box of adequate size to accommodate the required conduit and wiring. Wire nuts and lugs will be provided under Division 16 Electrical.

PART 3 - EXECUTION

3.1 SCHEDULE OF WORK

- A. The schedule of the mechanical work shall be arranged to suit the progress of work by the other trades and shall in no way retard progress of construction of the building.
- B. Work under this Division shall proceed in advance of the work of others whenever possible, eliminating cutting and patching. When such procedure is impossible, cutting and patching shall be done in an approved manner. Cutting shall not endanger structural function of the building. Patching shall match existing work. Actual work of cutting and patching of existing surfaces shall be performed by the subcontractor who originally prepared these surfaces, e.g., cutting and patching of masonry wall will be performed by the masonry subcontractor. Cutting shall be carefully done and damage to building, piping, wiring or equipment as a result of cutting shall be repaired by skilled mechanics of trade involved. Each Contractor shall furnish sketches showing locations and sizes of all openings, chases, etc. required for installation of his work.
- C. Contractor shall furnish and locate sleeves and inserts required before floors and walls are built. Contractor shall coordinate all drilling required for installation of his hangers.
- D. Exposed piping and ductwork shall be completely installed and ready for painting by General Contractor. Any incorrect and added work installed by Mechanical Contractor after the General Contractor has painted the areas shall be painted at no additional cost to the Owner.
- E. Contractor must cooperate completely with contractors providing equipment under other divisions of the specifications. This is particularly important in accordance with Division 16 Electrical.
- F. Space Priority:
 - 1. Ensure equitable use of available space for materials and equipment installed above ceilings. Allocate space in the order of priority as listed below. Items are listed in the order of priority, with items of equal importance listed under a single priority number.
 - a. Gravity flow piping systems.
 - b. Vent piping systems.
 - c. Ceiling recessed lighting fixtures.
 - d. Concealed air terminal units, fans.
 - e. Air duct systems.
 - f. Sprinkler systems piping.
 - g. Forced flow piping systems.
 - h. Electrical conduit, wiring, control wiring.

2. Order of priority does not dictate installation sequence. Installation sequence shall be as mutually agreed by all affected trades.
3. Change in order of priority is permissible by mutual agreement of all affected trades.
4. The work of a particular trade shall not infringe upon the allocated space of another trade without permission of the Contractor for the affected trade.
5. The work of a particular trade shall not obstruct access for installation, operation and maintenance of the work, materials and equipment of another trade.

G. Installation

1. Inaccessible Equipment:
 - a. Where the end user determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, equipment shall be removed and reinstalled or remedial action performed as directed at no additional cost to the end user.
 - b. The term "conveniently accessible" is defined as capable of being reached without the use of ladders 2'-0" greater than the ceiling height, or without climbing or crawling under or over obstacles such as motors, fans, pumps, belt guards, transformers, high voltage lines, piping, and ductwork. Equipment above ceilings shall be within 12" of top of ceiling.

3.2 BUILDING OPENINGS FOR ADMISSION OF EQUIPMENT

- A. Contractor shall ascertain from his examination of the architectural and structural drawings whether any special temporary openings in the building for the admission of apparatus furnished under this Contract will be necessary, and he shall notify the Architect accordingly. Failure to give this notification in sufficient time for Architect to arrange for same during construction shall not incur any additional cost to the Owner.

3.3 WORK IN EXISTING BUILDINGS

- A. Work in existing buildings must be scheduled during times when the buildings are occupied. Systems serving the existing buildings must be kept operative at all times. Temporary system shutdown shall be approved by the Owner prior to actual shutdown.
- B. Fixtures, equipment, piping, etc. that are removed and not indicated "to be reused" are to become property of the Contractor and shall be removed from the building site.
- C. Demolition drawings indicate approximate location, size and quantity of piping: Minor variations in location of piping exposed by removal of walls or openings in walls and required to maintain an operating system shall be relocated as directed at no additional expense to the Owner. Piping not required to maintain an operating system shall be removed. The Mechanical Contractor shall be responsible for the piping work involved in cutting required for all trades.
- D. Cutting and patching will be performed by the General Contractor. Contractor shall furnish sketches showing locations, and sizes of openings, chases, etc. required for installation of his work.

3.4 STORAGE AND PROTECTION

- A. Work, fixtures, equipment, and materials shall be protected at all times. The Contractor shall make good damage caused, whether directly or indirectly, by the workmen. Work shall be properly protected to prevent destruction or damage. Pipe and ductwork openings shall be closed with caps and plugs or plastic sheeting during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water, chemical, and mechanical injury.
- B. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store products subject to damage by the elements in weathertight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- C. Exterior Storage:
 - 1. Store fabricated products above the ground, on blocking or skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
- D. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.
- E. Protection After Installation:
 - 1. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove when no longer needed.

3.5 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site.
 - 1. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 - 2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

3.6 CLEANING

- A. Contractor shall be responsible for keeping the premises free of shipping cartons, crates, material scrap, pipe cuttings, etc. related to his work. Floors shall be protected with leakproof pans where pipe cutting or threading operations are in progress.

- B. Prime coated equipment, insulation, piping, and pipe covering shall be left dust-free where painting is not required. Thorough cleaning shall be done where painting is required.
- C. Factory finished painted equipment shall be washed with mild soap and water and left in first class condition, entirely free of stains or streaks. Abrasive materials shall not be used.
- D. Plumbing fixtures shall be cleaned with mild soap and water containing a disinfecting agent. Trim handles shall be set at same angle and trim shall be polished. Aerators shall be removed, cleaned and reinstalled after piping has been cleaned and disinfected. Pop-up wastes shall be checked for proper operation.
- E. Sumps, pits, trenches, manholes, catch basins, and floor drains shall be cleaned and left free of foreign material.

3.7 ELECTRICAL REQUIREMENTS

- A. Except as otherwise detailed or specified, all electrical devices, apparatus, etc., furnished in this Division, but which are not integral with the equipment served, will be installed under Division 16 Electrical.

3.8 EQUIPMENT CONNECTIONS

- A. Contractor shall connect equipment and/or fixtures requiring piping or plumbing connections.
- B. Equipment not particularly specified in this Division of the specification is either specified under other Divisions of these specifications, or furnished by the Owner: Plumbing work in connection therewith is to be included under this Division unless otherwise indicated. Contractor shall carefully examine drawings and other Divisions of the specifications and shall provide roughing-in, including traps, to connect this equipment to the piping or plumbing system, and leave ready for use and operation, with stops, supplies, etc.
- C. Connections to equipment shall be in accordance with shop drawings to be furnished by the equipment supplier.

3.9 SYSTEM START-UP

- A. Provide material and labor required to perform start-up of equipment and system prior to beginning of test, adjust and balance procedures.
- B. Plumbing, air conditioning, heating, and ventilating system shall be operated separately, or in conjunction with the other, for a sufficient period of time to demonstrate to satisfaction of the Architect the ability of the system to meet capacity and performance requirements while maintaining design conditions, in accordance with the true intent and purpose of these specifications. Contractor shall set and adjust mechanical and control equipment, appurtenances and other items as necessary to properly balance phases of the system and shall have the system operating and maintaining design temperature, humidity, and air circulation throughout the building. Contractor shall provide additional fan sheaves or pump impellers required to obtain design flow rates.

C. Design Conditions:

		INDOOR (deg. F)	OUTDOOR (deg. F)
1.	Occupied Cooling	72	94
2.	Occupied Heating	70	17
3.	Unoccupied Heating	67	17
4.	Night Setback – Cooling	78	94
5.	Night Setback – Heating	67	17

D. Prior to start of balancing, this Contractor shall review balancing test procedures with the Architect. Contractor shall provide information and assistance as required in cooperation with the test, adjust and balance service.

E. Start-up procedures shall be as follows:

1. Bearings:

- a. Inspect for cleanliness, clean and remove foreign materials.
- b. Verify alignment.
- c. Replace defective bearings, and those which run rough or noisy.
- d. Lubricate as necessary, and in accordance with manufacturer's recommendations.

2. Drives:

- a. Adjust tension in V-belt drives, and adjust varipitch sheaves and drives for proper equipment speed.
- b. Adjust drives for alignment of sheaves and V-belts.
- c. Clean, remove foreign materials before starting operation.

3. Motors:

- a. Check motor for amperage comparison to nameplate value.
- b. Correct conditions which produce excessive current flow, and which exist due to equipment malfunction.
- c. Verify rotation and direction of driven equipment is in accordance with design.

4. Valves:

- a. Inspect both hand and automatic control valves, clean bonnets and stems.

- b. Tighten packing glands to assure no leakage, but permit valve stems to operate without galling.
 - c. Replace packing in valves to retain maximum adjustment after system is judged complete.
 - d. Replace packing on any valve which continues to leak.
 - e. Remove and repair bonnets which leak.
 - 5. Verify that control valve seats are free from foreign material, and are properly positioned for intended service.
 - 6. Tighten flanges after system has been placed in operation. Replace flange gaskets which show any sign of leakage after tightening.
 - 7. Inspect screwed and welded joints for leakage. Promptly remake joints which appears to be faulty, do not wait for rust to form. Clean threads on both parts, apply compound and remake joints.
 - 8. After system has been placed in operation, clean strainers, dirt pockets, orifices, valve seats and headers in fluid systems, to assure being free of foreign materials.
 - 9. Remove rust, scale and foreign materials from equipment and renew defaced surfaces.
 - 10. Set and calibrate draft gauges of air filters and other equipment.
 - 11. Inspect fan wheels for rotation, clearance and balance. Provide factory-authorized personnel for adjustment when needed.
 - 12. Check electrical control circuit to assure that operation complies with specifications and requirements to provide desired performance.
 - 13. Inspect pressure gauges and thermometers for calibration. Replace items which are defaced, broken, or which read incorrectly.
 - 14. Repair damaged insulation.
 - 15. Vent gasses trapped in hydronic systems.
 - 16. Verify that liquids are drained from gas or air systems.
- F. Provide such periodic continuing adjustment services as necessary to insure proper functioning of mechanical systems after occupancy of the project, and for a period of one year after date of substantial completion.

3.10 COMPLETION OF WORK

A. Plumbing Fixture Caulking:

1. Where irregular walls cause gaps between fixture and wall, Contractor shall fill voids by caulking around fixture.

B. Operating Instructions:

1. Printed instructions, installed in suitable frame with glass front which covers operating and maintenance of each major item of equipment, shall be posted at locations designated by Architect. Bound manuals for equipment operating and maintenance instructions and parts lists shall be turned over to the Owner. Contractor shall carefully instruct Owner's operation man during adjustment and testing period of equipment for each length of time as may be necessary to thoroughly familiarize him with the proper care, operation and maintenance of the equipment.

C. Record Drawings:

1. During construction, the Contractor shall keep an accurate record of deviations between the work as shown on the contract drawings and that which is actually installed. He shall secure a set of blue line prints of the plumbing and mechanical drawings for this purpose, and note changes thereon in red ink, in a neat and accurate manner, thus making a complete record of all changes and revisions in the original design which exist in the completed work. The cost of furnishing above prints and preparing these record drawings shall be included in the contract price by the Mechanical Contractor. When revisions have been shown on these prints to indicate the work as installed, the prints shall be delivered to the Architect, before final payment.

D. Valve and Damper Placement Indication:

1. Where valves and dampers are located above suspended ceilings, an indication device (as approved by the Architect) shall be located in the tile below the device.

E. PAINTING OF NEW EQUIPMENT

New equipment painting shall be factory applied or shop applied, and shall be as specified herein, and provided under each individual section.

1. Factory Painting Systems: Manufacturer's standard factory painting systems may be provided subject to certification that the factory painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt-spray fog test. Salt-spray fog test shall be in accordance with ASTM B 117, and for that test the acceptance criteria shall be as follows: immediately after completion of the test, the paint shall show no signs of blistering, wrinkling, or cracking, and no loss of adhesion; and the specimen shall show no signs of rust creepage beyond 0.125 inch on either side of the scratch mark.

The film thickness of the factory painting system applied on the equipment shall not be less than the film thickness used on the test specimen. If manufacturer's standard factory painting system is being proposed for use on surfaces subject to

temperatures above 120 degrees F, the factory painting system shall be designed for the temperature service.

2. Painting Systems for Metal Surfaces (Shop or Field Painting): Clean, pretreat, prime and paint metal surfaces (2 coats); except aluminum surfaces need not be painted. Apply coatings to clean dry surfaces. Clean the surfaces to remove dust, dirt, rust, oil and grease by wire brushing and solvent degreasing prior to application of paint, except metal surfaces subject to temperatures in excess of 120 degrees F shall be cleaned to bare metal.

Two finish coats are required. Apply the second coat after the preceding coat is thoroughly dry. Lightly sand damaged painting and retouch before applying the succeeding coat. Color of finish coat shall be aluminum or light gray.

- a. Temperatures Less Than 120 Degrees F: Immediately after cleaning, the metal surfaces subject to temperatures less than 120 degrees F shall receive one coat of pretreatment primer applied to a minimum dry film thickness of 0.3 mil, one coat of primer applied to a minimum dry film thickness of one mil; and two coats of enamel applied to a minimum dry film thickness of one mil per coat.
- b. Temperatures Between 120 and 400 Degrees F: Metal surfaces subject to temperatures between 120 and 400 degrees F shall receive two coats of 400 degrees F heat-resisting enamel applied to a total minimum thickness of 2 mils.
- c. Temperatures Greater Than 400 Degrees F: Metal surfaces subject to temperatures greater than 400 degrees F shall receive two coats of 600 degrees F heat-resisting paint applied to a total minimum dry film thickness of 2 mils.

3.11 GUARANTEE OF WORK

- A. Contractor guarantees by his acceptance of the contract that work installed is free from defects in workmanship and/or materials, and that the apparatus will develop capacities and characteristics specified. If, during the period of one year or as otherwise specified from date of certificate of completion, defects in workmanship, material or performance appear, he will, without cost to the Owner, remedy such defects within a reasonable time to be specified in notice from Architect. In default thereof, the Owner may have such work done and charge cost to Contractor. Equipment guarantees from date of "start-up" or "delivery" will not be recognized.
- B. Comply, also, with the General Conditions and the Supplementary Conditions and the applicable Sections of Division 1 General Requirements.
- C. This Contractor shall service the installation for one year from date of substantial completion. This shall include emergency service and adjustment, with the exception of the oiling of motors and cleaning of filters and screens.

END OF MECHANICAL GENERAL PROVISIONS